

VAX 4000

Site Preparation

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Chapter 1

General Requirements

Read this chapter for general requirements. Then refer to Chapter 2 for the specific requirements of your system. To ensure smooth installation and operation of the system, your site must meet the requirements in both chapters before the arrival of your system shipment.

NOTE: *Digital recommends that a Digital service representative install your system.*

Digital provides a site preparation service. If you want Digital to prepare your site, contact your Digital service or sales representative.

1.1 System and Expander Enclosure Designations

The following table lists the enclosures in which the systems and expanders are shipped. For simplicity, enclosure designations are used throughout this manual rather than the system or expander name.

System or Expander	Enclosure
VAX 4000 Model 200 System (BA430)	BA430
VAX 4000 Model 200 System (BA215)	BA215
VAX 4000 Model 300 System	BA440
VAX 4000 Model 400 System	BA440
VAX 4000 Model 500 System	BA440
VAX 4000 Model 600 System	BA440
B400X Expander	BA430
R400X Expander	R400X
B213F Expander	BA213
R215F Expander	BA215

The physical requirements for your system are determined by its dimensions before and after the shipping carton is removed, space for

doors to swing open, space for peripheral equipment such as printers and terminals, allowances for adequate airflow around the system, and the noise emission level of the system.

1.2 Space Requirements

Before unpacking your equipment, make sure you have enough space to remove the system from its shipping carton. You need 1.5 to 1.8 meters (5 to 6 feet) to the side of the carton to allow room for rolling the system off its shipping ramp. Also make sure you leave enough space around the system so it can be serviced. The dimensions of cartons and enclosures are shown in Chapter 2.

You must leave at least 1 meter (39 inches) of clearance at the front of your system for opening the doors and to access system controls. You must also leave at least 5 centimeters (2 inches) of clearance at the sides and rear for airflow. Since the base of the enclosure is 5 centimeters (2 inches) wider than the cabinet in front and rear, you can place the rear of the system against a wall or table, and the system will have enough room for adequate airflow.

In addition to the space required for your system, you should ensure that you have enough space for any expanders, terminals, printers, mass storage media, printer paper, and other necessary supplies.

If you plan to connect your system to peripheral devices such as printers, terminals, or modems, you will need additional cabling. Cables that connect the system to peripheral devices must be ordered separately.

NOTE: *Cabling from peripheral devices should be in place and labeled before your system is installed.*

When planning cable routing for multiterminal equipment, you should consider factors such as safety, convenience, future expansion, and cost. And there are other factors to consider when cabling a multiterminal system on more than one floor in the same building or in more than one building. Digital offers several cable types for such applications, and Digital service personnel are available to help you plan your installation. Your sales representative can provide more information.

1.3 Operating Environment

Your system is affected by the discharge of static electricity, temperature changes, and humidity. Those conditions can affect the operation and overall dependability of your system.

1.3.1 Static Electricity

Static electricity is a common problem. It can cause system failure and loss of data. The most common source of static buildup is contact between people and carpeting or clothing. Low humidity allows the greatest buildup of static charges.

To minimize static buildup, follow these guidelines.

- Maintain a relative humidity of at least 40 percent.
- Locate your system away from busy office corridors.
- Avoid using carpeting in the computer area. If you must install carpeting, use antistatic carpeting if possible. If regular carpeting is already installed, place a grounded antistatic mat under your system.
- Maintain the antistatic properties of antistatic floors, carpeting, or mats by following the manufacturer's recommendations for cleaning.

1.3.2 Temperature and Humidity Ranges

Your system should be installed in a well-ventilated area where the temperature and humidity ranges listed in Chapter 2 for your system are maintained throughout the year.

Rapid temperature changes may affect system performance. Therefore, do not operate your system near heating or cooling devices, large windows, or doors that open to the outside. Air should contain a minimum of dust and other abrasive contaminants.

Mass storage media and other computer supplies, including paper, should be kept at the same temperature and humidity as that of the computer area.

When calculating the operating temperature in your environment, consider the heat that the system, peripherals, and other equipment generate. See Chapter 2 for the amount of heat dissipated by each system and expander.

1.4 Electrical Requirements

In determining the electrical requirements of your system or expander, consider the following.

- Voltage range
- Power-source phase
- Nominal frequency

- Frequency range
- Steady-state current
- Power consumption

When you are ready to use that information, turn to Chapter 2 and find the electrical requirements for your system.

1.4.1 Power Source

The power source should handle your system and allow for system expansion. Digital recommends a dedicated circuit from the power source for each system and a separate dedicated circuit for each expander. A dedicated ground circuit provides electrical isolation from power surges or electrical noise caused by other electrical equipment. You should not connect any other equipment such as air conditioners, office copiers, or coffee pots to the same circuit as your system or expander.

If you cannot avoid power disturbances, your system will need additional power-conditioning equipment. For more information, contact your Digital sales representative.

Each system shipped within North America includes a 120-Vac power cable. If your system will be shipped outside North America, or if you require a 240-Vac cable, you must order the power cable(s) separately. See the appendix for a list of the countries and their associated power cables.

1.4.2 Grounding

If you will be installing two or more enclosures (system or expander) and if they will be connected by a common DSSI bus, improper grounding can result in voltage potentials, called ground offset voltages, between the enclosures. And if those voltages exceed certain limits, data transmission across the DSSI bus can be disrupted and your system can experience performance degradation or data corruption.

To prevent system performance degradation or data corruption caused by excessive ground offset voltages:

1. Have a qualified electrician check to make sure your site power distribution system meets all local electrical codes.
2. Also have that electrician inspect your entire site power distribution system to make sure it does not have any of these faults.
 - a. Outlets do not have power ground connections.
 - b. Grounding prong missing from computer equipment power cables.

- c. Power outlet neutral connections are actually ground connections.
- d. Grounds for the power outlets are not connected to the same power distribution panel.
- e. Devices that are not UL or IEC approved are connected to the same circuit breaker as the computer equipment.

If all the requirements in steps 1 and 2 are met, the ground offset voltages should be within acceptable limits for DSSI operation. If any of those requirements cannot be met, after your system is installed and turned on you should check the ground offset voltages as described in the system *Installation manual*.

NOTE: *To ensure proper grounding, you should check the ground offset voltages even if all the requirements in steps 1 and 2 are met.*

1.5 Acoustics

Computer systems generate noise. Higher than acceptable noise levels can adversely affect your work environment. Digital recommends placing your system and B400X, R400X, B213F, and R215F expanders in an open office environment.

1.6 When Your Shipment Arrives

When your system arrives, you should inspect it with a Digital service representative to ensure that the system and all ordered options arrived undamaged.

When you are ready to begin installation, find the Customer Hardware Information Kit (in the system shipping carton) and begin using the *Installation manual* and *Installation Checklist* to install your system.

Chapter 2

Specific Requirements

This chapter lists system dimensions, acceptable temperature and humidity ranges, electrical requirements, and acoustic levels to consider in preparing your site.

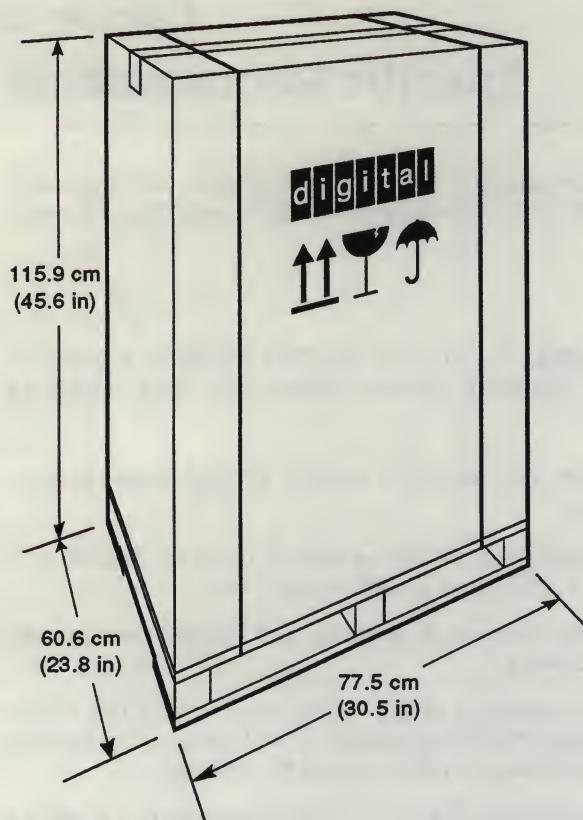
2.1 Dimensions

Your system and B400X, R400X, B213F, and R215F expanders are shown in this section with their shipping carton dimensions and enclosure dimensions.

WARNING: *To prevent injury, at least two people should move system, expander, or terminal cartons.*

- Section 2.1.1 shows the dimensions of the carton used to ship BA430 and BA440 systems and R400X and B400X expanders.
- Section 2.1.2 shows the dimensions of systems and expanders that use the BA430 or BA440 enclosure.
- Section 2.1.3 shows the dimensions of the carton used to ship the Model 200 (BA215) system and the R215F expander, as well as the dimensions of the Model 200 (BA215) system and the R215F expander.
- Section 2.1.4 shows the dimensions of the B213F expander and shipping carton.

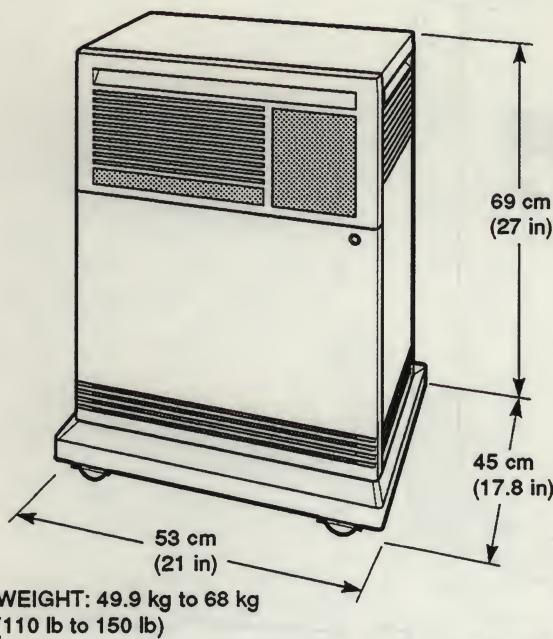
2.1.1 BA430/BA440 Enclosure and B400X/R400X Expander Shipping Carton Dimensions



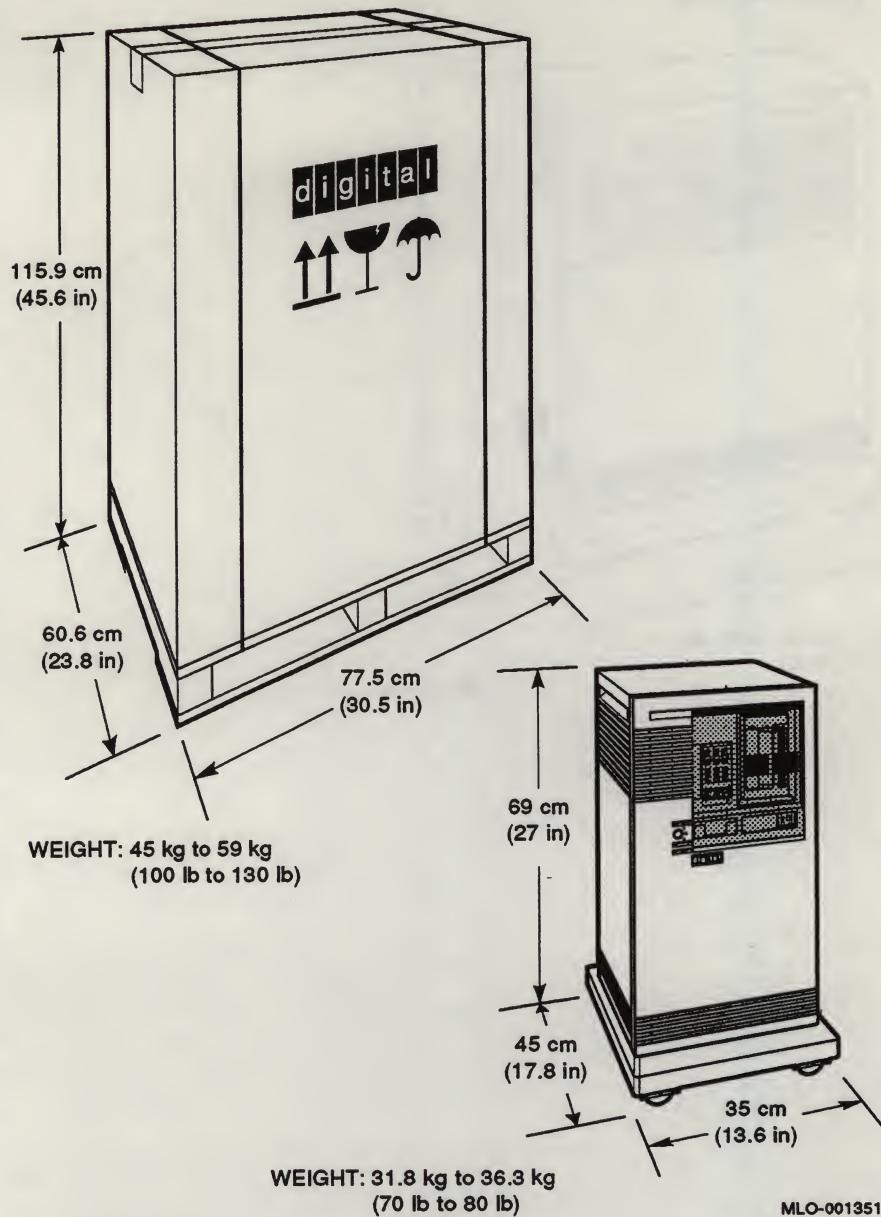
WEIGHT: 63.5 kg to 85.3 kg
(140 lb to 188 lb)

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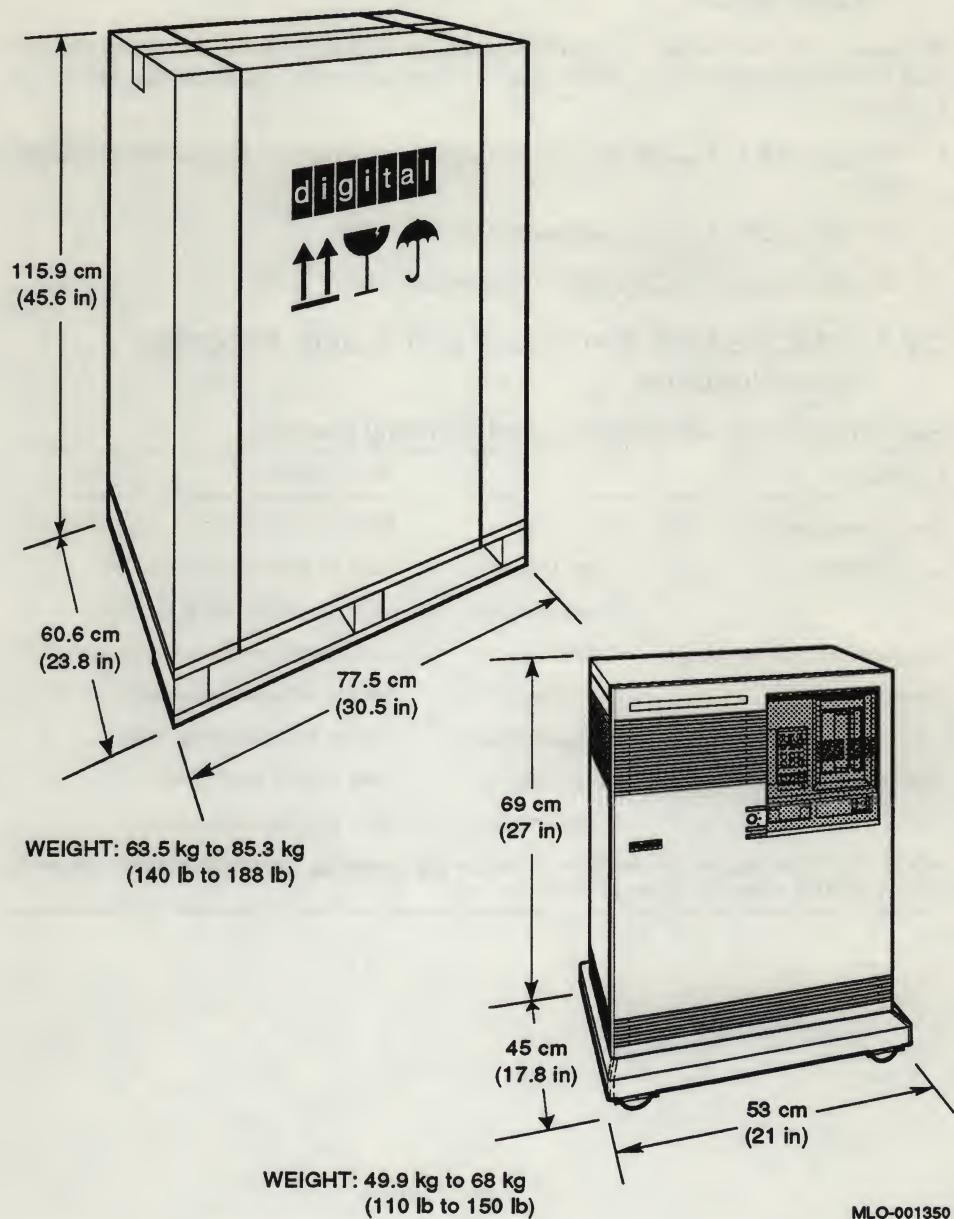
2.1.2 BA430/BA440 Enclosure and B400X/R400X Expander Dimensions



2.1.3 BA215 Enclosure and Shipping Carton Dimensions



2.1.4 B213F Expander and Shipping Carton Dimensions



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2.2 Heat, Humidity, Electrical Requirements, and Acoustics

Systems and expanders operate within or at the values for temperature and humidity, power requirements, and noise levels listed in the following sections.

- Section 2.2.1, BA430/BA440 enclosure and R400X expander specifications
- Section 2.2.2, BA215 enclosure specifications
- Section 2.2.3, BA213 enclosure specifications

2.2.1 BA430/BA440 Enclosure and R400X Expander Specifications

Heat Dissipation, Temperature, and Humidity Ranges

Condition		Measure
Heat dissipation	—	2980 BTU/h
Temperature	Operating:	10°C to 40°C (50°F to 104°F)
	Nonoperating:	-40°C to 66°C (-40°F to 151°F)
Temperature rate of change	Operating:	11°C (20°F) per hour maximum
Relative humidity	Operating:	20% to 80% noncondensing
	Nonoperating:	10% to 90% noncondensing
Maximum altitude	Operating:	2438 meters (8000 feet)
	Nonoperating:	4877 meters (16,000 feet)

NOTE: For operation above sea level, decrease the operating temperature range values by 1.8°C per 1000 meters (1°F per 1000 feet).

Operating Acoustic Emission Levels

LNPE (B)	LPA (dB)
6.6	61
Recommended placement:	Office environment
NOTES:	
LNPE = Noise power emission level (A-weighted sound power level) measured in bels reference 1 pico-watt	
LPA = Sound pressure measured in decibels at 1.0 meter from the front edge of the unit and 1.5 meters above the floor.	
Levels may be lower than those shown, depending on the kind and number of mass storage devices in the system.	
All data measured in accordance with ANSI S12.10-1985 (American National Standards Institute) and ISO/DIS 7779 (International Standards Organization).	

Electrical Requirements

Nominal AC Voltage =>	100 to 120 Vac	220 to 240 Vac
Voltage range	90 to 128 Vac	176 to 264 Vac
Power-source phase	Single	Single
Nominal frequency	50 to 60 Hz	50 to 60 Hz
Frequency range	47 to 63 Hz	47 to 63 Hz
Maximum steady-state current at nominal voltage	11.9 A	5.8 A
Maximum steady-state current at minimum voltage	11.9 A	5.8 A
Maximum inrush current	100 A	83 A
Maximum power consumption	850 W	850 W

2.2.2 BA215 Enclosure Specifications

Heat Dissipation, Temperature, and Humidity Ranges

Condition		Measure
Heat dissipation	—	1178 BTU/h
Temperature	Operating:	10°C to 40°C (50°F to 104°F)
	Nonoperating:	-40°C to 66°C (-40°F to 151°F)
Temperature rate of change	Operating:	11°C (19.8°F) per hour maximum
Relative humidity	Operating:	20% to 80% noncondensing
	Nonoperating:	10% to 90% noncondensing
Maximum altitude	Operating:	2438 meters (8000 feet)
	Nonoperating:	4877 meters (16,000 feet)

NOTE: For operation above sea level, decrease the operating temperature range values by 1.8°C per 1000 meters (1°F per 1000 feet).

Operating Acoustic Emission Levels

LNPE (B)	LPA (dB)
6.1	48
Recommended placement:	Office environment

NOTES:

LNPE = Noise power emission level (A-weighted sound power level) measured in bels reference 1 pico-watt

LPA = Sound pressure measured in decibels at 1.0 meter from the front edge of the unit and 1.5 meters above the floor.

Levels may be lower than those shown, depending on the kind and number of mass storage devices in the system.

All data measured in accordance with ANSI S12.10-1985 (American National Standards Institute) and ISO/DIS 7779 (International Standards Organization).

Electrical Requirements

Nominal AC Voltage \Rightarrow	101 Vac	120 Vac	220-240 Vac
Voltage range	88 to 110 Vac	93 to 132 Vac	176 to 264 Vac
Power-source phase	Single	Single	Single

Nominal AC Voltage \Rightarrow	101 Vac	120 Vac	220–240 Vac
Nominal frequency	50 to 60 Hz	50 to 60 Hz	50 to 60 Hz
Frequency range	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz
Maximum steady-state current at nominal voltage	5.2 A	4.4 A	2.4 A
Maximum steady-state current at minimum voltage	8.3 A	7.2 A	3.9 A
Maximum inrush current	50 A	50 A	50 A
Startup current (30 seconds) at nominal voltage	7.1 A	5.9 A	3.1 A
Maximum power consumption	340 W	340 W	340 W

2.2.3 BA213 Enclosure Specifications

Heat Dissipation, Temperature, and Humidity Ranges

Condition		Measure
Heat dissipation	—	2304 BTU/h
Temperature	Operating:	10°C to 40°C (50°F to 104°F)
	Nonoperating:	-40°C to 66°C (-40°F to 151°F)
Temperature rate of change	Operating:	11°C (20°F) per hour maximum
Relative humidity	Operating:	20% to 80% noncondensing
	Nonoperating:	10% to 90% noncondensing
Maximum altitude	Operating:	2438 meters (8000 feet)
	Nonoperating:	4877 meters (16,000 feet)

NOTE: For operation above sea level, decrease the operating temperature range values by 1.8°C per 1000 meters (1°F per 1000 feet).

Operating Acoustic Emission Levels

LNPE (B)	LPA (dB)
5.7	42
Recommended placement:	Office environment

NOTES:

LNPE = Noise power emission level (A-weighted sound power level) measured in bels reference 1 pico-watt

LPA = Sound pressure measured in decibels at 1.0 meter from the front edge of the unit and 1.5 meters above the floor.

Levels may be lower than those shown, depending on the kind and number of mass storage devices in the system.

All data measured in accordance with ANSI S12.10-1985 (American National Standards Institute) and ISO/DIS 7779 (International Standards Organization).

Electrical Requirements

Nominal AC Voltage \Rightarrow	101 Vac	120 Vac	220-240 Vac
Voltage range	88 to 110 Vac	93 to 132 Vac	176 to 264 Vac
Power-source phase	Single	Single	Single

Nominal AC Voltage \Rightarrow	101 Vac	120 Vac	220–240 Vac
Nominal frequency	50 to 60 Hz	50 to 60 Hz	50 to 60 Hz
Frequency range	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz
Maximum steady-state current at nominal voltage	10.2 A	8.6 A	4.7 A
Maximum steady-state current at minimum voltage	11.4 A	9.9 A	5.4 A
Maximum inrush current	100 A	100 A	100 A
Maximum power consumption	670 W	670 W	670 W

2.3 Additional Expander Requirements

An expander in your system has the following additional requirements.

- B400X, R400X, B213F, and R215F expanders require dedicated wall outlets.
- B400X, R400X, B213F, and R215F expanders must be installed by a Digital service representative when the system or expander is not part of a factory-configured system.
- When installing a B213F or an R215F expander on a system, an H4010-AA expander cable kit is required.

See the appendix for the required power cables.

Appendix A

Power and Ground Cable Part Numbers

Refer to the sections in this appendix and locate your system. Then order the power cable listed for your country.

Ground cables are listed in Section A.4.

For more information on 240-Vac operation, check with your Digital sales representative.

A.1 Power Cables for BA430/BA440 Enclosure Systems and B400X/R400X Expanders

Part Number	Country
BN20A-2E	United States, Japan, Canada (120 Vac)
BN20B-2E	United States, Japan, Canada (240 Vac)
BN22C-2E	Australia, New Zealand (240 Vac)
BN22D-2E	Central Europe (240 Vac)
BN22E-2E	United Kingdom, Ireland (240 Vac)
BN22F-2E	Switzerland (220 Vac)
BN22H-2E	Denmark (220 Vac)
BN22J-2E	Italy (240 Vac)
BN22K-2E	India (240 Vac)
BN22L-2E	Israel (240 Vac)

NOTE: A 120-Vac power cable, BN20A-2E, is shipped with each 120-Vac system.

A.2 Power Cables for BA215 Enclosure Systems and R215F Expanders

Part Number	Country
BN20M-2E	United States (120 Vac)
BN20N-2E	United States, Japan, Canada (240 Vac)
BN19J-2E	Australia, New Zealand (230/240 Vac)
BN03B-2E	Central Europe (240 Vac)
BN19B-2E	United Kingdom, Ireland (240 Vac)
BN19F-2E	Switzerland (220 Vac)
BN19L-2E	Denmark (220 Vac)
BN19T-2E	India (240 Vac)
BN19Y-2E	Israel (240 Vac)
BN19N-2E	Italy (240 Vac)

NOTE: A 120-Vac power cable, BN20M-2E, is shipped with each 120-Vac system.

A.3 Power Cables for B213F Expanders

Part Number	Country
BN20A-2E	United States (included with each 120-Vac system)
BN20B-2E	United States, Japan, Canada (240 Vac)
BN20C-2E	Australia, New Zealand (240 Vac)
BN20D-2E	Central Europe (240 Vac)
BN20E-2E	United Kingdom, Ireland (240 Vac)
BN20F-2E	Switzerland (240 Vac)
BN20H-2E	Denmark (240 Vac)
BN20J-2E	Italy (240 Vac)
BN20K-2E	India (240 Vac)
BN20L-2E	Israel (240 Vac)

NOTE: A 120-Vac power cable, BN20A-2E, is shipped with each 120-Vac system.

A.4 Ground Cables

Part Number	Description
BC21G-50	15.24 meter (50 foot) #6 grounding strap
BC21G-25	7.62 meter (25 foot) #6 grounding strap

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